Sem-V Electronics (CBGS) 17/5/11.

Design with linear Integrated Circuit

QP Code: 31088

(3 Hours) [Total Marks: 80]

N. B.: (1) Question No. 1 is compulsory.
(2) Solve any three out of remaining questions.
(3) Assume suitable data if necessary.

1. (a) Explain behaviour of op-amp in linear and saturation region with neat graphs.
    (b) Explain non-inverting comparator with suitable example.
    (c) State various methods to achieve analog to digital conversion.
    (d) Explain 78XX series voltage regulator.
    (e) Implement \( y = 3 \text{ va} - 5 \text{ vb} + 7 \text{ vc} \) using op-amp, where \( \text{y} \) is output and \( \text{va}, \text{vb} \) & \( \text{vc} \) are inputs.

2. (a) Derive expression for voltage gain of inverting amplifier and hence design the same for voltage gain = 20.
    (b) Design a 2nd order KRC low pass filter with \( f_o = 1 \text{ KHz} \) and \( Q = 5 \).

3. (a) Draw the circuit diagram of an inverting type schmitt trigger circuit.
    Design such a circuit to meet \( \text{UTP} = +2.5 \text{ V} \) & \( \text{LTP} = -1 \text{ V} \)
    Assume \( \pm \text{vsat} = \pm 12 \text{ V} \), for an input of \( 8 \text{sinwt} \), plot the graph of \( \text{vo} \) and \( \text{vin} \).
    (b) Explain working of Wien bridge oscillator and hence design for \( f_o = 5 \text{ KHz} \).

4. (a) Explain R/2R ladder type DAC
    (b) Design mono stable multivibrator using IC 555 to generate output delay of 10 msec.

5. (a) Design voltage regulator using IC 723 for \( V_o = 10 \text{ V} \) and \( I_L = 200 \text{ mA} \).
    (b) Explain internal diagram of power amplifier LM 380

6. Write short notes on:
   (a) Sample and Hold circuit
   (b) V-I converter
   (c) Applications of IC 555
   (d) Switching mode voltage regulator

FW-Con. 10269-16.